

OFFSHORE OIL & GAS SECTOR STRATEGY

2014 TO 2017

STRATEGIC CONTEXT

1 This strategy sets out how HSE's Energy Division will regulate health and safety of the offshore oil and gas industry operating on the UK Continental Shelf. The regulatory framework will not change, but the strategy marks a significant change to the way HSE will approach regulation of the industry and how it engages with key industry representatives and the workforce to drive improvement in health and safety standards.

2 The strategy covers what HSE will do to regulate the sector, but also what oil and gas operators, contractors and other industry stakeholders should do to improve the health and safety performance of the industry.

3 The principal major hazard risks that could cause the death of many offshore workers – fire and explosion associated with hydrocarbon releases and loss of structural integrity and stability - are well known. So are the precautions.

4 HSE and industry have made many attempts to ensure these risks are consistently well-managed across the industry. These attempts have been only partially successful. There has not been a consistent focus to ensure necessary improvements are applied across the whole of industry and that improvements are sustained. This strategy aims to rectify this by ensuring senior industry leaders take responsibility for the delivery of high standards of health and safety offshore.

5 Traditionally, we have focussed upon operators as defined within the regulations – those responsible for the installation. This strategy recognises that this cannot be right when contractors employ 85% of the work force. The strategy aims to ensure that all those with influence over the conditions to which workers are exposed, contribute to ensuring risks are properly controlled.

6 Preventing major accidents requires the maintenance of production facilities and the sub-sea pipeline network. This contributes to maintaining oil and gas production and bringing product to shore. In this way, achievement of good health and safety standards will reduce the risk of major pollution incidents and contribute to securing the energy resilience of the UK, as well as protect workers.

7 To maintain production, the industry is exploiting smaller, higher pressure, fields in deeper waters. This will require investment in new assets and the extension of the life of existing plant. These factors present both safety and commercial challenges. Sir Ian Wood¹ has considered how

¹ Report by Sir Ian Wood [UKCS Maximising Recovery Review: Final Report](#)

regulation of the licensing and fiscal elements of the industry should be coordinated to maximise oil and gas recovery. Many of the conclusions he reaches about what industry must do to secure its economic future, particularly improving cooperation, the sharing of learning and the importance of securing the integrity of ageing plant mirror themes in this strategy.

8 Deliberately, the strategy does not address every aspect of offshore health and safety. Industry is already managing some personal health and safety issues well. HSE expects industry to maintain its performance in these areas without our direct input. The strategy does not address other risks, particularly helicopter and sea-going vessel risks because other regulators lead on these.

9 There is an implementation plan which sets out in more detail how together we will achieve the aims and objectives and monitor progress and achievements. The aims of the strategy will not change. The objectives and contributions of key stakeholders to the implementation plan will evolve.

DESCRIPTION OF THE SECTOR²

10 The UK offshore oil and gas industry consists of 107 oil and gas plus 181 gas producing installations, located on 383 producing fields. There is a supporting infrastructure of 14,000 km of pipelines connecting installations to beach terminals. Industry commissioned many of these assets in the early 1970s and some are now forecast to continue operating to 2030 and beyond.

11 Exploration for new resources continues. The number of mobile offshore drilling units (MODUs) in operation varies year to year, from ten to thirty.

12 Currently, the majority of activity is in the North Sea, with other activity in the Irish Sea and West of Shetland. Some 50 new field developments are planned across all sectors including 8 West of Shetland. West of Shetland, the weather and sea conditions, distances from shore and the absence of a readily available onshore infrastructure present further challenges to the industry.

13 Operators and contractors employ over 32,000 workers in offshore activities. Many tens of thousands more are employed in supporting roles and activities. The strategy aims to secure the safety of all those working offshore.

14 Oil and gas production is strategically important to the UK economy, meeting around 50% of our total primary energy needs. It contributes £50 billion annually to the balance of payments by reducing energy imports and through exported goods. Its UK supply chain recorded revenues of £27 billion in 2011.

² [Oil & Gas UK Economic report 2013](#)

15 Although declining from the 1999 high, production is expected to continue into the 2050s. £13.5 billion was invested in the sector in 2013 and investment is expected to rise further to exploit new fields and increase recovery in existing fields. 2013 – 2015 will be the most active drilling period in the last 15 years. It is forecast that some 130 wells will be drilled over the next 3 years.

16 Production is declining as the most easily accessed fields are exhausted. New fields tend to be in deeper waters and under higher temperatures and pressures, further testing the integrity of assets and providing a more aggressive environment in which to work.

17 Whilst there is significant investment in new infrastructure, much of the existing infrastructure is ageing and has been exposed to a harsh environment and heavy usage. Approximately 50% of offshore platforms are beyond their original design life. As higher temperature, higher pressure reserves are exploited the challenge to asset integrity increases. Well construction and integrity is under greater challenge. To guarantee asset integrity, much work is required to ensure that corrosion and other factors have not affected the structural strength of pipelines, installations or the integrity of topside plant and equipment.

18 Asset integrity must be addressed at every stage of the life cycle, including:

- The application of inherent safe design principles
- Effective written schemes of examination for safety critical equipment, specified plant, pipelines and wells
- Effective maintenance of installations, wells and pipelines
- Operation within design limits and operating envelope
- Arrangements for managing change

19 It requires investment in design reviews and increased maintenance. Asset integrity management is a core factor influencing investment. New facilities must not be constructed at the expense of adequate maintenance of older facilities that remain in service. Consideration must also be given to integrating old and new assets. For example, a new production facility may rely upon an aging pipeline. If the pipeline cannot support the additional pressures from the new facility, safety is at risk and the investment is wasted.

20 The combination of additional investment, additional maintenance to secure asset integrity and an ageing workforce, means the industry faces a challenge to secure sufficient, competent engineers and personnel to meet the challenges.

21 Whilst the focus of this strategy is the prevention of a major incident, the isolated nature and surrounding environment mean that should an incident occur, it is also essential that mitigation measures such as gas detectors, fire-fighting systems and refuge and escape facilities are available and maintained.

22 The decommissioning of offshore installations has started. This is likely to accelerate from 2017 onwards. Over the next two decades, this will involve many installations, up to 5,000 wells and 10,000 km of pipelines.

THE PRINCIPAL HEALTH AND SAFETY RISKS

23 HSE's main concern must be eliminating the risk of major hazard incidents in which many workers could be killed or injured. Piper Alpha and Macondo are examples.

Major hazard risks

24 **Fire and explosion** Fire and explosion can result from the ignition of any released hydrocarbon. Typical sources of hydrocarbon releases (HCRs) are the well, the pipeline riser, other pipelines and pipe work and associated process plant. Releases can occur from either failure of the asset itself due to corrosion, abrasion or fracture, or because of failures of maintenance e.g. poor practice when breaking and re-making joints, or insufficient operational controls. HCRs can also result from damage due to other failures e.g. dropped objects during crane operations.

25 Industry has recognised the importance of controlling HCRs and challenged itself to reduce them. By April 2013, industry had almost achieved its target of reducing releases by 50%. It undertook to achieve a further 50% reduction by 2016. At the end of 2013, HCRs had risen by 30% compared to an equivalent period in 2012. Industry should respond to the challenge it set itself and reverse this unacceptable trend.

26 Floating production installations now account for some 30% of UKCS production and their use is likely to increase. In comparison to fixed installations, they have a higher rate of HCRs. Operators of these installations need to act to make sure they eliminate HCRs.

27 **Loss of stability/Loss of station** Floating installations are also of concern because they can lose stability and buoyancy following collisions, loss of control of ballast systems and environmental action. They can also lose station through failures of anchors and tethers or engine problems.

28 All these risks prevail across the offshore industry. Effective management and control remains central to the continued safety of every offshore installation. Ensuring effective management of these issues will be fundamental to HSE's regulatory activities.

29 It is also essential that where control measures fail, measures to mitigate risks are in place, for example, gas detection systems and fire deluge arrangements. Escape, Evacuation and Rescue measures (EER) should also be in place for occasions when other combined measures have failed. Systems should not just be in place but tested to ensure plant and equipment

works when required. It is crucial that personnel are competent and understand how to interpret warnings and take necessary action.

30 **Structural failure** This is of growing concern as assets age. It includes structural failure of a major element of an offshore structure due to corrosion, fatigue, overloading or impact from, for example, vessels or dropped objects.

Personal health and safety

31 Offshore workers are exposed to a range of hazards associated with manual handling, use of chemicals, slips and trips etc. The accident rates offshore are currently about half that of onshore construction and onshore industrial activities and are slightly lower than onshore wholesale/retail activities³.

32 HSE is satisfied the industry overall has demonstrated a good standard of management of these issues. Consequently, it does not plan to proactively inspect personal health and safety conditions, except for noise, hand-arm vibration, mechanical handling/crane operation and on certain installations – asbestos management. However, it will monitor performance to ensure standards are maintained.

33 **Noise and vibration** There remains work to be done to reduce noise exposure – 30% of the workforce is exposed beyond the second action level (85dB(A)). HSE believes industry can do much more to separate workers from noisy activities and reduce noise at source and more work should be done to minimise the risks of hand-arm vibration (HAV).

34 **Mechanical handling and crane operations** Mechanical handling and crane operations present a significant risk to people. Crane operations and dropped objects that could damage plant are also potential major hazard precursor events. These remain one of the most prevalent causes of reportable dangerous occurrences offshore and therefore, inspectors will examine these operations routinely.

35 **Diving** Risks associated with diving and diving-related operations include a dropped diving bell or sudden decompression of a saturation system. HSE's approach to offshore diving is set out in a separate diving strategy.

Personal environmental health issues

36 These include water quality, food hygiene, legionnaire's disease and other outbreaks of infection. Whilst generally well controlled by the industry, these issues continue to have the potential for widespread illness and loss of life. HSE will maintain the current level of inspection of these issues and monitor performance to ensure standards are maintained.

³ [Oil & Gas UK Health & Safety Report 2013](#)

HEALTH AND SAFETY REGULATION

37 Operators of offshore oil and gas installations are subject to a permissioning regime under the Offshore Installations (Safety Case) Regulations 2005. These require the operator, before the installation is brought into use, to ensure and then demonstrate to HSE that they have identified all major hazard risks, assessed these risks and applied suitable measures to control the risks.

38 Other regulations, particularly the Offshore Installations (Prevention of Fire and Explosion, Emergency Response) Regulations 1995 and Offshore Installations and Wells (Design and Construction etc) Regulations 1996, address key offshore risks and apply to all employers and others responsible for offshore operations.

39 The Health and Safety at Work Act 1974 Application outside Great Britain Order 2013 applies prescribed provisions of the Health and Safety at Work Act and associated regulations to specified offshore health and safety matters.

40 HSE inspectors assess safety cases submitted by operators. They then inspect operations to ensure that standards set out within the safety case are met in practice.

41 Inspectors may also investigate accidents to and complaints from workers and the circumstances associated with any dangerous occurrence or major hazard precursor event such as a HCR.

42 Inspectors will undertake their work in line with the HSE's [HID Regulatory Model](#). They will sample key risk control systems to assess the overall management performance of the dutyholder. During inspections and investigations, inspectors will seek to identify both the immediate reason for the failure and its underlying cause. They will take action both to remedy the immediate problem and secure change that ensures the problem will not recur.

43 Inspectors will inform operators and other dutyholders of actions necessary to comply with the law. Where inspectors are of the opinion that there is a risk of serious personal injury, they may prohibit the activity. Where they identify significant failures to comply with the law, leading to risk to workers, they will require the dutyholder to comply within a suitable period.

44 Inspectors may also refer failures to comply with the law to the courts (via the Procurator Fiscal in Scotland, or directly in England and Wales). Matters are referred to the courts to secure either compliance with the law or obtain justice.

45 HSE inspectors exercise their powers in line with the Regulator's Compliance Code and the regulatory principles under the Legislative and Regulatory Reform Act

2006. They will follow [HSE's Enforcement Policy Statement](#) and make judgements in line with the [Enforcement Management Model](#).

46 [HSE's Enforcement Policy Statement](#) requires our work to be:

- Transparent - we should be able to demonstrate what we do, why we do it and how we reach our conclusions. This strategy is an important element of transparency in our dealings with the offshore industry
- Targeted - in the case of the offshore industry major accident hazards are our main concern and duty holders should be targeted for interventions on the basis of the level of risk they manage and their performance in managing that risk
- Proportional - all our actions should be proportional to risk
- Consistent - we should take similar action in similar circumstances to achieve similar ends, the strategy sets out these ends
- Accountable - the industry and public can and should expect us to work to the aims and standards within this strategy and bring it to our attention when we fall short

47 Our regulation is undertaken within a wider context. Whilst we will always take the protection of the safety and health of offshore workers as an overriding priority, we also recognise that the industry operates within a complex environment. This strategy looks to encourage industry cooperation, leadership etc. in a context that supports all aspects of good business practice and effective exploitation of resources.

48 Which installations and duty holders will be subject to planned inspection is decided by ranking based upon:

- The inherent hazard of the installation
- Operator performance, including an assessment of the effectiveness of the management of risk at the installation(s)
- Other operational intelligence (e.g. a new entrant to the sector is more likely to be subject to inspection)

49 A number of installations are of significant strategic importance to the UK's oil and gas production. Ensuring the integrity of these installations is therefore essential to protect workers and secure energy supplies. It is therefore a factor in how HSE prioritises its inspections.

50 To achieve this HSE must maintain its capability to deliver its range of interventions. This includes ensuring:

- The competence of individual inspectors and other staff
- The competences match those needed to deliver the strategy
- It has sufficient total resource
- That the available resource can be applied flexibly and can respond to changing circumstances.

